Book of Abstracts

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Accounting for land use contribution to climate change in agricultural LCA: Which methods? Which impacts?

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Abstract

Soil organic carbon (SOC) plays a key role in soil functioning, i.e. soil quality. Land use affects SOC and soil quality. However, despite various methodological developments, there is still no scientific consensus on the best method to assess the holistic impact of land use and land use change within LCA. The SOCLE project aimed to review how SOC is accounted for in LCA and to test the feasibility and sensitivity of best methodological options. In total, five crop products (annual/perennial, temperate/tropical) and two livestock products were investigated through 32 scenarios of land use changes (LUC) and agricultural land management changes (LMC). Three methodologies were applied, IPCC Tier 1-2 (2006), Müller-Wenk & Brandaõ (2010) and Levasseur et al. (2012). The accounting of LUC and LMC influences greatly the results on the climate change impact category. Based on the project results, we recommend accounting systematically for the impact of LULUC on climate change by applying, *a minima*, the comprehensive IPCC Tier 1 approach (2006). When available, site-specific data should be used (e.g. Tier 2) for SOC stocks but also C:N ratio and in order to model the digressive impact over 90% of the time period needed to reach equilibrium.

Keywords: *Soil carbon, Climate change, Land use, Agricultural practices.*

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